TECHNICAL NOTES

LAKE STATES FOREST EXPERIMENT STATION
U.S. DEPARTMENT OF AGRICULTURE · · FOREST SERVICE

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Effect of the Micro-Site on the Condition and Early Growth of Planted Black Spruce

Results at the end of the second growing season show that 2-1 black spruce has made better growth on furrow slices than in furrow bottoms on the Wausaukee Timber Harvest Forest 1/ in northeastern Wisconsin.

These trees were bar-planted early in 1953 on a highly leached sandy flat which is underlain by a horizon of gley. Several inches of water may accumulate and stand in this depression for short periods during prolonged rainy spells or at the time of the spring snow melt, but conversely, the site may be extremely droughty if the precipitation drops below normal for more than a few weeks.

Counts made in December 1954 indicate clearly that the spruce transplants in the bottoms of the furrows are not as vigorous or healthy as those on the ridges of overturned soil (table 1). Moreover, the dark green color of the stock on the plow slices contrasts strikingly with the yellow-green foliage of the trees which are in mineral depressions.

There was no significant difference between the survival of the 2-1 spruce on the ridges (94 percent) and in the furrows (92 percent). Height growth, however, is considerably better on the ridges (table 2). This advantage amounts to 38 percent in total height (12.3 inches compared to 8.9 inches) and about 150 percent (4.3 inches versus 1.7 inches) for tip elongation in 1954.

One question which remains unanswered is the possible effect of a series of dry years on modifying the foregoing growth relationships. An earlier study 2/ showed that such differences in favor of stock planted on the furrow slices were still strongly pronounced at the end of the eighth year, but this experiment, like the Wausaukee planting, involved a period during which the amount and distribution of the annual precipitation were almost ideal.

1/ Maintained cooperatively by the Wisconsin Conservation Department, the Extension Service of the University of Wisconsin, and the Lake States Forest Experiment Station.

2/ Stoeckeler, Joseph H. 1947. Planting poorly drained wet sites. Lake States Forest Expt. Sta. Tech. Note 276. 1 p. (Processed)

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(Over)

Table 1.--Condition and vigor of 2-1 black spruce after two growing seasons

Condition of trees[1/]	Number of seedlings		Percentage of trees in each condition class	
	On plow slices	In furrow bottoms	On plow slices	In furrow bottoms
Growing	258	18	45.7	9.8
Living	282	116	49.9	63.0
Failing	25	50	4.4	27.2
Total	565	184	100.0	100.0

1/ In December 1954, 41 trees classed as growing averaged 14.7 inches in total height and had added 5.7 inches of terminal increment during the past growing season; 46 living trees averaged 10.4 inches and 2.5 inches; and 13 failing 7.8 inches and 0.6 inch, respectively.

Table 2.--Total and current season (1954) height growth of planted black spruce[1/]

Condition class	Trees on plow slices			Trees in furrows		
	Number	Ave. total height in 1954	Ave. height growth in 1954	Number	Ave. total height in 1954	Ave. height growth in 1954
		Inches	Inches		Inches	Inches
Growing	10	14.4	5.7	2	13.5	5.5
Living	10	10.2	2.8	8	9.9	2.1
Failing	0	0	0	10	7.1	.6
Total or average	20	12.3	4.3	20	8.9	1.7

1/ Height measurements were taken for every tenth tree.